Journal of Physical Education & Health, 2018, vol. 7 (11), 5-14

ICT USE IMPLICATIONS FOR EXERCISE PARTICIPATION AND HEALTH IN THE NIGERIAN UNIVERSITY COMMUNITY

DOMINIC, Olufunmilola L.[1], SEIDINA, Iliasu Y.[1], Williams, D. F.[2], Oyerinde, O. O.[3], Olaitan 'L.[4], Onifade, O. A.[4]

[1]Department of Human Kinetics Education, University of Ilorin, Ilorin, Nigeria

[2]Department of Clinical Pharmacy and Pharmacy Practice, University of Ilorin, Ilorin, Nigeria

[3]Department of Physical and Health Education, Bayero University, Kano, Nigeria

[4]Department of Health Promotion and Environmental Health Education, University of Ilorin, Ilorin, Nigeria

Abstract

Background: *ICT use encourages deviation from a physically active lifestyle and might surreptitiously become a contemporary contributor to chronic diseases. The study was conducted to examine the extent of ICT use and its implications for exercise participation and health in the Nigerian University Community.*

Methods: *A descriptive survey research design involving permanent members of the University of Ilorin, Nigeria was used. A multistage sampling technique was used to select 767 staff and students with an age range of 15–60 years. The University of Ilorin ethical review committee granted clearance (UERC/ASN/2016/588). The respondents were informed and all signed the informed consent form. A validated questionnaire, "Information and Communication Technology Use and Sedentariness Questionnaire (ICTUSQ)" with reliability (r=.89), was used for data collection. Statistical analyses conducted were frequency, percentage and One-way ANOVA; p≤0.05.*

Result: *The most common types of ICT activities among the Nigerian University Community were: mobile phones calls/texting 91.0% (n=698), online-chats 90.9% (n=697), computer use 69.9% (n=536) and viewing TV/DVD 64.5% (n=495). Due to ICT use, respondents were continuously sedentary for several hours daily. Only 34.8% (n=267) of them participated in the recommended amount of exercise, the majority 81.0% (n=621) reported that they were too busy to exercise. ICT-induced health problems included shoulder pain 60.9% (n=467), thumb pain 68.6% (n=526), fatigue 33.0% (n=253), phone addiction 84.3% (n=646) and anxiety/depression 76.1% (n=544). Irrespective of age, factors that largely determined the extent of ICT use were gender, n=767, F(9, 757)=407.73, p≤0.005; occupation, n=767, F(9, 757)=163.79, p≤0.002; and type of job, n=767, F (9, 757)=639.45, p≤0.003.*

Conclusion: *Excessive ICT use leads to sedentariness and a reduction in the desire to exercise. The accumulated effect might accelerate the risk of cardiometabolic, cardiovascular, physiological and mental disorders. Regular physical activity breaks of at least 5 minutes each hour of continuous ICT use, and the introduction of physical education and sport programmes to inculcate sustainable physical activity culture in the university community is recommended.*

Keywords: *Ergonomic, Exercise, Health, ICT use, Physical activity, Sedentariness*

Introduction

The development of information and communication technology (ICT) has had a considerable effect on human lives. Examples of such ICT devices include digital cameras, game consoles, television, digital video discs (DVD), mobile phones, the computer, internet and mobile devices. The great ease of working, processing information, communicating or relaxing that ICT use has created has changed former lifestyle patterns (Prince et al, 2015). Exposure to ICT and multimedia devices constantly encourage Nigerians to sit down with a greater inclination for comfort that impedes all physical effort and neglects our culture of

physical activity. Most official and commercial buildings now have elevators, more people take flights, and travel in cars even over walkable distances of a few hundred metres (Dominic, Onifade & Lajide, 2010; Hamilton, Hanilton & Zderic, 2007).

In the same vein, Maiyaki and Garbati (2014) have lamented the decline of physical activity among tertiary institution students in Nigeria, but the integration of ICT with advances in life practices tends to divert more people towards sedentariness at a rate that might increase the health challenges of Nigeria through incidences of several forms of chronic diseases among children and adults. The gradual spread of ICT devices spanning from the invention of home computers to laptops, smart phones and other smaller mobile devices have increased access to a vast amount of information coupled with new access to life changing opportunities including innovations in collaborative technology and home grown solutions for Africa in areas like agriculture, climate change, financial services and healthcare delivery services (The World Bank, 2012). Recent information channels include the internet, satellite televisions as well as the Social Networks (SNs) like Facebook, Instagram, Twitter, WhatsApp and LinkedIn (Anderson & DeWolfe, 2003; Rosenbush, 2006). The daily presence of SNs and the related activity of Nigerians, especially young people, is very high. Aside from spending several hours viewing television/DVDs daily, many people who engage in office-based work spend 8 to 10 hours a day sitting behind the desk either working or attending meetings (Adams, 2004; Proper, 2012). This increases the risk of mental overload and stress, which are consequences of high exposure to sedentariness.

Trembley et al (2017) have defined sedentariness as any waking activity characterized by an energy expenditure of ≤1.5 metabolic equivalents of the task (MET) and a sitting or reclining posture. MET is used to quantify energy in multiples that are relative to an individual's resting metabolic rates. An MET is equivalent to the rate of oxygen consumption (VO2) that is approximately 3.5ml of oxygen consumed per kilogram of body weight per minute for an average adult who is sitting down quietly. This implies that an individual performing a physical activity of 3METs has a VO2 that is three times higher than someone who is sitting down quietly. Alternatively, MET can be expressed using slow walking (which has a MET of 2.0), meaning that energy expenditure increases by 2.0 times more than when sitting down quietly (Ainsworth, 2000). The working of MET suggests that energy expended in physical activity is a function of the type and amount of physical exertion involved in a particular activity. Hence, energy expenditure is regarded as a continuum where physical activity (PA) level is classified as sedentary, if PA≤1.5METs; light, if PA>1.5METs but ≤3METs; moderate, if PA>3METs but ≤6METs; and vigorous, if PA>6METs (Trembley et al, 2017).

Meis, Kremers and Bouman, (2012) have reported that sedentary behaviour has been found to be a predictor of weight gain (Wijndaele et al, 2009), type 2 diabetes (Krishnan, Rosenberg, Palmer, 2009), cardiometabolic risk (Healy, 2008; Wijndaele et al, 2009; Dunstan et al, 2010), specific cancers (Howard et al, 2008), cardiovascular diseases (Hamilton, Hamilton & Zderic, 2007), and all-cause mortality and cardiovascular mortality (Inoue et al, 2008; Katzmarzyk, Church, Craig & Bouchard, 2009; Dunstan et al, 2010). Insufficient physical activity and lack of exercise allows easy development of atherosclerosis, damage of cardiac muscles and heart due to increase of pressure on the arteries and restriction of blood flow to the organs. If this condition is heightened, it may result in cardiovascular disease and/or cardiac arrest (Schofield, Quigley & Brown, 2009). In addition, prolonged sitting is associated with the risks of breast cancer and colon cancer, which seem to be more influenced by sitting too much (Colen, 2011), and it has been confirmed that less sitting might prevent 37,000 cases of lung cancer, 30,600 cases of prostate cancer, 12,000 cases of endometrial cancer, and 1,800 cases of ovarian cancer. Despite the reported risks, sedentary lifestyles are increasing not only in developed countries but also in developing countries; the situation is not considered to be significant for public health particularly in Nigeria (Maiyaki & Garbati, 2014) where many people

still consider physical activeness as unnecessary stress.

The use of ICT has some ergonomic implications that have resulted in different types of musculoskeletal disorders among users (Thomee, Dellve, Haresntam & Hagberg, 2010). Most of these disorders, ranging from short term discomfort to chronic conditions, were due to having bad sitting posture, postural hygiene, excess weight, lack of muscular strength and physical activity (Airaksinen et al, 2006). Examples of short term musculoskeletal disorders associated with ICT use include non-specific pains from the neck, shoulders, lower back and upper extremities, fingers and wrist (Airaksinen et al, 2006; Yang, Chen, Huang & Chang, 2016). Repetitive movement of a particular muscle group that is typical to the use of ICT devices could result in chronic conditions known as Carpal Tunnel Syndrome (CTS) (Adeyemi, 2010; Shiri & Falah-Hassani, 2015). Many people in the Nigerian University Community have a higher preference for laptop computers because these have greater power, are portable and innovative. Unfortunately, this has higher implications for the risk of CTS because the screen is married to the keyboard and it is difficult to place both the screen and keyboard at an ideal height. This creates postural problems that mostly affect the upper body.

The International Labour Organization (ILO) (as cited in Adeyemi, 2010) has noted that the ergonomic problems of most workers in developing countries like Nigeria are not given a high priority among occupational health and safety considerations. This could be attributed to poor employee welfare and general lack of awareness among employers and ICT users. ICT use has an implication for the communities of higher learning where a number of academic and administrative tasks are carried out using ICT. In addition, ICT causes electromagnetic hypersensitivity with the visual display unit affecting the skin and eyes which become strained after staring at the screen for a long time. The use of a small keyboard on a mobile phone has been reported by Themee, et al. (2010) to cause musculoskeletal symptoms and pain in the thumbs, hands, back and neck, a condition he describes as Texting Tendonitis (TT). Other physiological symptoms include headaches, earaches, sensations of warmth and fatigue (Thomee et al, 2010). Most people assume awkward postures that cause them to hunch/flex their head, neck and upper back down towards their devices (Muscolino, 2012). The worst of these postures are associated with the use of mobile devices.

Most Nigerians tend to be inactive and sit during their leisure time due to use of various ICT devices, most of which now have amazingly advanced features that make them more attractive to users. In fact, Martin (2011) has noted that electronic screen use (such as watching television/DVDs, computer use, video games and portable devices) are the most common leisure activities in developing as well as many industrialized countries. Of course, the use of ICT affords individuals a very easy way to enjoy their leisure time. Most people have been reported to spend excessive time on ICT use; and several children exceed the recommended maximum of two hours a day of screen use for leisure (Thomee et al, 2010) which might lead to avoidable negative health consequences. Addo, et al. (2015) and Aladeniyi et al. (2017) have pointed out that leisure sitting time was associated with overweight and obesity. Similarly, Brown, Williams, Ford, Ball and Doboson (2005) have also observed that there is weight gain among females with increased sitting time. They explained that “women who sat for more than 4½ hours daily were more likely to have increase in weight by over 5kg within 5 years”. Sedentary time increases the incidence of higher cholesterol, fasting insulin, weight problems, obesity and increases the risk of premature death. Dominic, et al. (2010) and Silva, et al. (2018) have observed that one of the four common causes of chronic diseases such as heart disease, stroke, cancer, diabetes, obesity and arthritis is a lack of physical activity.

The continual increasing sophistication of ICT devices makes it possible for users to work from anywhere, such as at home, in vehicles and other places with many of them finding it difficult to separate work from their private lives. This is a situation that causes role stress, role conflict and overload, technological stress, sleep disturbance

and problems, low mood, a sense of loneliness, depression and frustration for most individuals whose work is largely ICT based (Thomee et al, 2010). Heightened stress resulting from higher levels of computer dependency as obtained in the Nigerian University Community can lead to increased blood pressure, heart attacks and other chronic diseases.

ICT use and Internet dependence in childhood, youth or adulthood has been associated with increasing depressive symptoms (Martin, 2011; Thomee et al, 2010). There is irrefutable evidence that being physically active later in life depends on an individual's ability to feel confident in an activity setting. This type of confidence most often comes from having learned fundamental movement and sport skills, or physical literacy, as a child. This is necessary for school physical education, academic and recreational sports programmes and integrating physical activity and an ergonomic conscious lifestyle for sustainable educational development.

Research has also shown that without the development of physical exercise literacy, many children and young people withdraw from physical activity and sport and turn to more inactive and/or unhealthy choices during their leisure time (Silva et al, 2018). This has an implication for sustainable physical education and sport programmes in tertiary institutions' communities since they are the sole producers of skilled manpower in Nigeria. While integration of ICT into most schedules of the University system in Nigeria has been rapid, there is scant information regarding its influence on the physical activity and heath of members. It is well established that while health remains an inevitable determinant of productivity among members of any community, physical activity and exercise are a major facilitator for health and wellbeing. Therefore, the objective of this study was to examine the extent of ICT use in our university community and its implication for sustainable physical activity and sport programmes to inculcate a healthy lifestyle and wellbeing among students, staff and all community members.

Research Methodology

The research design was a descriptive survey involving all the permanent members of the University of Ilorin, Nigeria. Out of 823 that were sampled, only 93.2% (n=767) respondents participated in the study. The rest did not complete the instrument properly and were excluded. Multistage sampling techniques that comprised of stratified, proportionate (10%) and random sampling were used. Participants were stratified and randomly selected based on occupations which consisted of 84.2% (n=646) students, 12.4% (n=95) university staff and 3.3% (n=26) staff of private organizations. Regarding gender, 60.2% (n=462) were male and 39.8% (n=305) were female. Their age ranged from 15 to 60 years with a frequency distribution of 15-19 years (35.2%, n=270), 20-24 years (30.8%, n=236), 25–29 years (16.4%, n=162), 30–34 years (6.0%, n=46), 35–39 years (2.5%, n=19), 40–45 years (3.4%, n=26) and 45–60 years (5.7%, n=44). The respondents engaged in different types of job that involved ICT use. Their job description showed that there were 82.9% (n=636) students, 4.6% (n=35) typists, 4.6% (n=23) lecturers, 2.9% (n=22) computer analysts, 2.9% (n=22) bankers, 2.3% (n=18) self-employed and 1.4% (n=11) accountants. The University of Ilorin ethical review committee granted clearance for the study (UERC/ASN/2016/588). The respondents were adequately informed and all signed the informed consent form.

A validated questionnaire, "Information and Communication Technology Use and Sedentariness Questionnaire (ICTUSQ)" with reliability coefficient (r=.89), was used for data collection. The questionnaire was divided into sections A and B. Section A focused on respondents' demographic data such as gender, age, occupation and type of job, while section B focused on self-reported ICT behaviours that were rated using a four-point likert type rating (strongly agree, agree, disagree and strongly disagree) scale. The instrument was validated for both face and content validity while the reliability was ascertained using the test retest method. The data generated via instrumentation was regrouped into positive responses (strongly

agree + agree) and negative responses (disagree + strongly disagree) and was analysed using frequency count and percentage for the demographic data and answering of the research questions. The inferential statistic of One-way analysis of variance (ANOVA) was used to analyse the hypotheses at a 0.05 alpha level. For variables where differences occurred, the effect size was calculated to ascertain the magnitude of difference. The SPPS 20.0-version application software was used for the statistical analyses.

Results

Table 1. Descriptive Analysis of the Participants' ICT Use, Preferences to Exercise and Induced Health Problems

S/N	Indicators	Positive Response n (%)	Negative Response n (%)
	Common Type of ICT Activities of the Participants		
1	Viewing TV/DVD	495 (64.5)	272 (35.4)
2	Telephone calls/texting	698 (91.0)	69 (9.0)
3	chatting online	697 (90.9)	70 (9.2)
4	Using computer	536 (69.9)	231 (30.1)
5	**ICT Use and Prolonged Sitting Hours**		
6	Continuous sitting at the computer for at least 4hours daily	546 (71.2)	221 (28.8)
7	Leisure time TV/DVD sitting or at least 3hours	459 (59.9)	308 (40.2)
8	ICT induced sitting on Saturday for at least 3hours	350 (45.6)	417 (54.4)
9	ICT induced sitting on Sundays for at least 3hours	345 (45.0)	422 (55.0)
	ICT Use and Desire to Participate in Physical Exercise		
10	ICT use is more comfortable than physical exercise	325 (42.3)	442 (57.6)
11	Too busy to exercise but able to find time for ICT use	621 (81.0)	146 (19.0)
12	No work place regulation regarding physical exercise and ICT use	404 (52.6)	363 (47.4)
13	Participate in 3-5 times weekly exercise of 30 - 40 mins/day	267 (34.8)	500 (65.2)
	Common ICT Use Induced Physiological/Musculoskeletal Disorders		
14	Neck Pain	311 (40.5)	456 (59.5)
15	Upper back Pain	295 (34.4)	472 (51.5)
16	Shoulder Pain	467 (60.9)	300 (39.1)
17	Pain in the thumb	526(68.6)	241 (31.4)
18	Fatigues	253 (33.0)	514 (67.0)
19	Ear warmth	591 (77.0)	176 (22.9)
20	Eye strain	503 (65.5)	264 (34.4)
21	High preference for consumption high energy foods during ICT use	452 (58.9)	415 (41.1)
22	Difficulty in positioning of laptop & mobile phone at suitable height for the user	620 (80.8)	147 (19.2)
	Common ICT Use Induced Mental Disorders		
23	Mobile phone addiction	646 (84.3)	121 (15.8)
24	Neglect of body Signals for Personal needs	654 (85.3)	113 (14.7)
25	Anxiety and depression	544 (76.1)	183 (23.9)
26	Information overload	618 (80.5)	149 (19.4)

The results in table 1 were sub-divided into five sections showing descriptive analysis of the respondents' ICT behaviour, preference for using ICT over exercise and ICT induced health problems. Responses in the first section showed that there were four common type of ICT activities the respondents mainly engaged in. The highest of these was using mobile phones to make calls/send text messages 91.0% (n = 698) of respondents. This was closely followed by chatting online 90.9% (n = 697) of respondents; mobile phones were mainly used for this although some of them used computers or both, especially when it involved sending e-mails or Facebook messages. The next most common activity was using computers 69.9% (n=536) respondents, which was more common among lecturers, bankers, typists and computer operators than among students. The least common was viewing TV/DVD 64.5% (n=495) respondents.

In the second section we investigated whether ICT use induced prolonged sitting among the respondents. It was found that 71.2% (n=546) of the respondents spent not less than 4 hours using ICT, especially on weeks days and 59.9% (n = 459) of them sat for at least 3 hours using TV/DVD during leisure time. They also spent at least 3 hours using ICT during the weekend, more of them on Saturday 45.6% (n=350) than on Sunday 45.0% (n=345).

The third section dealt with a preference for ICT use over exercise especially during leisure time; 65.2% (n=500) of the respondents did not participate in recommended exercise of 30–40 minutes for 3-5 days per week. The majority of them 57.6% (n=442) claimed they prefer exercise to ICT use; however, 81.0% (n=621) reported that they were too busy to exercise, even though they could still find time to use ICT. This is probably because ICT is easy to use and is required a lot for both academic and occupational purposes. In addition, the majority of the respondents 52.6% (n=404) reported that there were no workplace regulation regarding physical exercise and duration of ICT use. Perhaps the respondents were ignorant of the risk associated with sedentariness resulting from prolonged ICT use; or that ICT use reduces the desire to engage in physical exercise.

Table 2. One-Way-ANOVA of ICT Use and Prolonged Sitting Hours

Variable	Model	Sum of Squares	df	Mean Square	F	η
Gender	Regression	152.30	9	16.92	407.73*	0.83
	Residual	31.42	757	42.00		
	Total	183.72	766			
Age	Regression	1988.82	2	220.98	1.22	-
	Residual	137.06	757	181.00		
	Total	2125.87	766			
Occupation	Regression	291.58	9	32.40	163.79*	0.94
	Residual	149.73	757	198.00		
	Total	441.32	766			
Type of Job	Regression	1845.42	9	205.05	639.45*	0.88
	Residual	242.74	757	321.01		
	Total	2088.16	766			

*significant at 0.05 alpha level

The fourth section elicited information on common ICT use inducing physiological/ musculoskeletal disorders. The response showed 80.8% (n=620) had difficulty in positioning there ICT devices - specifically, laptop and mobile phones - without assuming awkward postures. This resulted in disorders like neck pain 40.5% (n=311), upper back pain 34.4% n=295), shoulder pain 60.9% (n=467), pain in the thumb 68.6% (n=526), fatigue 33.0% (n=253), ear warmth 77.0% (n=591), eye strain 65.5% (n=503) and high preference for consumption of high energy foods 58.9%

(n=452), such as carbonated soft drinks, fries and pastries during ICT use.

Findings concerning ICT use inducing mental disorder were reported in the fifth section of the table. Most of them reported mobile phone addiction 84.3% (n=646), neglecting body signals for personal needs 85.3% (n=654) like eating, thirst, physical activity and even using the restroom. They also reported anxiety and depression disorders 76.1% (n=544), which could have resulted from long term ICT addiction.

The result in table 2 shows a one-way ANOVA conducted to examine the difference in ICT use among members of the university community with respect to age, gender, occupation and type of job. No significant difference existed among the respondents' ICT use in terms of age n=767, F (2, 766)=1.22, p≥0.15. This implied that age was not a determinant factor of the extent to which people in the Nigerian University Community used ICT. There was however a significant difference among the respondents when the other factors were considered: gender, n=767, F (9, 757)=407.73, p≤0.005; occupation, n=767, F (9.757)=163.79, p≤0.002; type of job, n=767, F (9, 757)=639.45, p≤0.003. The extent to which this factors exerted differences in the level of ICT use among the respondents was large, η2 values were; gender=.83, occupation=.94 and type of job=.88.

Discussion of Findings

ICT use is highly relevant for effective execution of occupational tasks and other life endeavours. This was largely demonstrated in this study by the extent to which members of the Nigerian University Community used it for several hours during week days and weekends. Confirming the submissions of (Schofield et al, 2009; Martin, 2011), the mostly preferred ICT devices were mobile phones, the computer and TV/DVD to satisfy needs like chatting, making calls and relaxing during leisure. The use of ICT influenced their lifestyle towards sedentariness (Adams, 2004; Proper, 2012) as many of them, though agreeing that ICT should not be preferred to exercising actually spent excessive time using ICT without considering exercise during their leisure time, despite the enormous health and fitness benefits that are accruable from regular exercise. Only 34.8% (n=267) of them participated in the recommended amount of exercise. Compared to reports in previous studies (Dominic et al, 2010; Maiyaki & Garbati, 2014), the proportion of those not exercising as recommended was higher among members of this Nigerian University community. This is unexpected considering the fact that the university community is an academic environment where the most educated people in the country are to be found. This suggests a low awareness of the dangers of excessive ICT use or mere negligence of physical activity (Dominic et al, 2010; Hamilton et al, 2007), which predisposes them to a high risk of excessive weight gain, chronic diseases and mortality (Wijndaele et al, 2009, Krishnan et al, 2009; Healy et al, 2008; Healya & Owena, 2010). Therefore, it is blatant that an intervention programme is required to inculcate the culture of physical activeness in the Nigerian university community. If the programme is well executed, it will positively impact on a lifetime of sustainable physical activity, especially among the students on whom the future of Nigeria depends.

ICT use was found to cause physiological and musculoskeletal disorders. The most prevalent of these were pain in the shoulder; pain in the thumb (tendonitis) and ear warmth which are associated with threshold shifts during the duration of long phone calls. According to Thomee et al (2010), these could cause deafness. Similarly, the university community members suffer eyestrain while using the computer or handset, indicated high consumption of energy food while using ICT. Frequent consumption of high energy food among sedentary workers has been well documented to lead to obesity, reduced cardiovascular fitness and increased risk of dying from heart disease (Adam, 2004; Martin, 2011; Schofield et al, 2009). In line with the opinion of Muscolino (2012) that unhealthy posture is largely associated with ICT use, we found that respondents who used laptop and portable devices like mobile phones were mostly affected because it is often difficult to place these devices at the ideal position for their height, hand and

eyes. Most people tend to hunch their backs and slouch their necks downward while using mobile phones or laptops. This is prevalent in the Nigerian University Community as most of the furniture has not been produced with ergonomic considerations (Adeyemi, 2010). This finding indicates a high risk of ICT induced musculoskeletal defects among members of Nigerian University Community.

The sophistication and multitasking features of modern ICT devices has increased its importance to such an extent that many people are becoming ICT addicted. This study revealed that the majority of people in the Nigerian University Community were affected by mental disorders which included ICT addiction, anxiety and depression, and an inability to process information properly for optimal benefits. These mental disorders are linked with sedentariness (Proper, Brown & Owen, 2007; Thomee et al, 2010; Martin, 2011; Olsen, 2012) as well as low productivity and an inability to fulfil one's full potentials, which could have a serious negative economic effect on the whole of Nigeria if many people become affected.

Independent of age, the factors that largely determine the extent of ICT use among members of the Nigerian University Community were gender, occupation and type of job. This implies that ICT-related sedentariness is generally influenced by the purpose for which an individual uses ICT (Adams, 2004; Proper, 2012). Females are generally known to engage in longer duration of sedentariness than males do, hence they exhibit greater risk of potential for chronic cardiometabolic and cardiovascular diseases like weight problems, obesity and high waist circumference (Healy et al, 2008). In fact, these risks increase proportionately with the duration of sedentariness (Colen, 2011). Our study revealed that occupation was the greatest determinant of ICT induced sedentariness followed by job description (type of job) and then, gender.

Although ICT-induced sedentariness may not be immediately harmful, the accumulated effects can accelerate the risk of the identified health problems. This suggests that if those who use ICT a lot are aware and conscious of the time they spend sitting with their ICT devices, they could effectively minimize the risk of these diseases.

Conclusion

The use of ICT is vital to members of the university community in Nigeria. The extent of ICT use was not determined by age but occupation, gender and type of job. Excessive use of ICT in the university community leads to sedentariness and reduction in the desire to engage in physical exercise which might increase the risk of cardiometabolic and cardiovascular diseases. Prolonged ICT use with poor posture resulted in physiological/ musculoskeletal and mental disorders among members of the Nigerian University Community. With awareness and consciousness of ICT use, these problems can be averted. In view of these, we recommend that:

1. Those who depend heavily on ICT use, either at work or for study purposes, should take regular breaks of at least 5 minutes each hour to walk around, climb the stairs and stretch.
2. Ergonomic consideration and physical exercise should be given a high priority at work and school. At home, leisure time should not be spent using ICT alone but combined with exercise.
3. There is a need to introduce special physical education and sports programmes into academia in order to inculcate a sustainable culture of physical activity. This can be achieved through awareness seminars, the repositioning of staff games, university sports and physical education, teacher preparation, and admission and training processes. This would motivate the general public to adopt a life style policy of "moving more, sitting less".

References

1. Adams, M. (2004). *Sedentary Lifestyle causes more deaths than smoking*. Retrieved August 26, 2016 from https://www.naturalnews.com/001547.html#.
2. Addo, P. N. O., Nyarko, K. M., Sackey, S. O., Akweongo, P. & Sarfo, B. (2015). Prevalence of obesity and overweight and associated factors among financial institution workers in Accra Metropolis, Ghana: a cross sectional study. BMC Res Notes *8*(599), 1-8.
3. Adeyemi, O. A. (2010). ICT Facilities: ergonomic effects on academic library staff. *Library philosophy and practice- Electronic Journal*. Retrieved August 9, 2016 from http://digitalcommons.unl.edu/libphiprac/343/.
4. Ainsworth, B. E., Haskel, W. L., Whitt, M. C., Irwin, M. L., Swartz, A. M. Strath, S. J., et al. (2000). Compendium of physical activities: an update of activity codes and MET intensities. *Medicine & Science in Sports & Exercise 32(9Suppl.).* S498–504.
5. Airaksinen, O., Brox, J. I., Cedraschi, C., Hildebrandt, J. Klaber-Moffettt, J., Kovacs, F. et al. (2006). European guideline for the management of chronic non-specific low back pain. *Eur SpineJ. 15*(2), 192–300.
6. Aladeniyi, I., Adeniyi, V. O. ., Fawole, O., Adeolu, M., Goon, D. T., Ajayi, A. I. & Omolara, E. O. (2017). Pattern and correlates of obesity among public service workers in Ondo State, Nigeria: a cross- sectional study. *South African Family Practice 59*(6), 195-200.
7. Anderson, T., & Dewolfe, C. (2003). My Space: *The history of its creation*. Retrieved 2012 from http://freeMySpace.com/history.htm.
8. Brown, Williams, Ford, Ball and Doboson (2005). Identifying the Energy Gap: Magnitude and Determinants of 5-Year Weight Gain in Midage Women. *Obesity Research 13*(8), 1431-1441.
9. Colen, H. (2011). *Avoid Sedentary Lifestyle*. Retrieved November 13, 2016 from http://www.jonbarr.org.
10. Dominic, O. L., Onifade, O. A. & Lajide, E. O. (2010). Body mass index and waist/hip ratio among female woukers in University of Ilorin, Nigeria. *Medicina Sportiva 6*(4), 1467-1472.
11. Dunstan, D. W., Barr, E. L.M, Healy, G. N, et al. (2010). Television viewing time and mortality: the Australian diabetes, obesity and lifestyle study (ausdiab) *Circulation 121* (3), 384–391. [PubMed].
12. Hamilton, M. T., Hamilton, D. G. & Zderic, T. W. (2007). Role of low energy expenditure and sitting on obesity, metabolic syndrome, type 2 diabetes and cardiovascular diseases. *Perspective in Diabetes 56*, 2655–2667.
13. Healy, G. N., Dustan, D.W., Salmon, J., Shaw, J.E., Zimmet, P.Z., & Owen N. (2008). Television time and continuous metabolic risk in physically active adults. *Medicine & Science in Sports & Exercise 40*(4), 639-645.
14. Healya, G. N. & Owena, N. (2010). Sedentary behaviour and biomarkers of cardiometabolic health risk in adolescents: an emerging scientific and public health issue. *Rev Esp Cardiol 63*(3), 261-264.
15. Howard, R. A, Freedman, D. M., Park. Y., Hollenbeck, A., Schatzkin, A., Leitzmann, M.F. (2008). Physical activity, sedentary behavior, and the risk of colon and rectal cancer in the NIH-AARP Diet and Health Study. *Cancer Causes and Control 19*(9), 939–953.
16. Inoue, M., Iso, H., Yamamoto, S. et al. (2008). Daily total physical activity level and premature death in men and women: results from a large-scale population-based cohort study in Japan (JPHC study) *Annals of Epidemiology 18*(7), 522–530. [PubMed].
17. Katzmarzyk, P.T., Church, T. S., Craig, C. L. & Bouchard, C. (2009). Sitting time and mortality from all causes, cardiovascular disease, and cancer. *Medicine and Science in Sports and Exercise 41*(5), 998 – 1005. [PubMed].
18. Krishnan, S., Rosenberg, L., Palmer, J. R. (2009). Physical activity and television watching in relation to risk of type 2 diabetes: the black women's health study. *American Journal of Epidemiology 169*(4), 428–434.
19. Maiyaki, M. B. & Garbati, M. A. (2014). The burden of non-communicable disease in Nigeria; in the context of globalization. *Annals of African Medicine 1*(1), 1–10.
20. Martin, K. (2011). Electronic overload: *The impact of excessive screen use on child and adolescent health and wellbeing*. Retrieved July 31, 2016 from www.naturepolesa.org94/assets/file.
21. Meis, J. J. M. Kremers, S. P. J. & Bouman, M. P. A. (2012). Television viewing does not have to be sedentary: motivation to participate in a tv exercise program. *Journal of Obesity 752820*. doi: 10.1155/2012/752820 PMCID: PMC3236521.
22. Muscolino, J. E. (2012). *Body mechanics. America massage therapy journal*. Retrieved October 16, 2012 from http://www.amtamassage.org/uploads/cms/doc…
23. Olsen, E. (2012). *How does sedentary lifestyle affect the brain*? Retrieved November 13, 2016 from http://www.share.com.
24. Prince, S. A., Gresty, K. M., Reed, J. I., Wright, E. Tremley, M. S & Reid, R. D. (2015). Individual, social and physical environmental correlates of sedentary behaviour in adults: a systematic review protocol. *Systematic Review Journals 3*(120), 1-8.
25. Proper, K. I., Cerin E., Brown W.J., & Owen, N. (2007). Sitting Time and Socio – economic differences in overweight and obesity. *International Journal of Obesity*, 31(1), 169–176.
26. Rosenbush, S. (2006). *Facebook's on the block*. *BusinessWeek 2006 – 03*. Retrieved January 15, 2017 from http://www.businessweek.com.

27. Schofield, G., Quigley, R. & Brown, R. (2009). *Does sedentary behaviour contribute to chronic disease or chronic disease risk in adults? a report of prepared by the scientific committee of agencies for nutrition action*. Retrieved April 30, 2018 from www.ana.org.nz.
28. Shiri, R. & Falah-Hassani, K. (2015). Computer use and carpal tunnel syndrome: A meta-analysis. *J Neurol Sci. 15*(349), 1-2.
29. Silva, D. A. S., Chaput, J., Katzmarzyk, P. T., Fogelholm, M. & Hu, G. (2018). Physical education classes, physical activity, and sedentary behaviour in children. *Medicine and Science in Sports and Exercise 50*(5), 955–1004.
30. The World Bank (2012). *ICTs delivering home-grown development solutions in Africa*. Retrieved July 15, 2018 from https://www.worldbank.org/en/news/features/2012.
31. Thomee, S., Dellve,L., & Hagberg, M. (2010). Percieved connections between Information and communication technology use and mental symptoms among young adults – a qualitative study. BMC *Public Health 2010*, 10:66doi:10:1186/1471– 2458 –10–66.
32. Trembley, M. S., Aubert, S. Barnes, J. D., Saunders, T. J., Carson, V., Latimer-Cheung, A. E...et al. (2017). Sedentary Behaviour Research Network (SBRN) – Terminology consensus project process and outcome. *International Journal of Behavioural Nutrition and Physical Activity 14*(75), 1-17.
33. Wijndaele, K., Lynch, B. M., Owen, N., Dunstan, D.W., Sharp S., Aitken, J. F. (2009). Television viewing time and weight gain in colorectal cancer survivors: a prospective population-based study. *Cancer Causes & Control 20*(8), 1355–1362.
34. Yang, S. Chen, M., Huang, Y. & Chang, J. (2016). Association between smart phone use and musculoskeletal discomfort in adolescent students. *Journal of Community Health 42*(3), 1-8.

Received: March 2018
Accepted: June 2018
Published: September 2018

Correspondence

DOMINIC, Olufunmilola L.
E-mail: lolafunmidom@gmail.com